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ABSTRACT

The United States Training and Employment Service General Aptitude Test Battery (GATB), first published in 1947, has been included in a continuing program of research to validate the tests against success in many different occupations. The GATB consists of 12 tests which measure nine aptitudes: General Learning Ability; Verbal Aptitude; Numerical Aptitude; Spatial Aptitude; Form Perception; Clerical Perception; Motor Coordination; Finger Dexterity; and Manual Dexterity. The aptitude scores are standard scores with 100 as the average for the general working population, and a standard deviation of 20. Occupational norms are established in terms of minimum qualifying scores for each of the significant aptitude measures which, when combined, predict job performance. Cutting scores are set only for those aptitudes which aid in predicting the performance of the job duties of the experimental sample. The GATB norms described are appropriate only for jobs with content similar to that shown in the job description presented in this report. A description of the validation sample is also included. (AG)

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# TECHNICAL REPORT

ON

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

LOADER (can. & preserv.) 8-04.10

B-621 S-341

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U. S. Employment Service
in Cooperation with
Pennsylvania State Employment Service

May 1965

GATB# 2549

# STANDARDIZATION OF THE GENERAL APTITUDE TEST BATTERY

FOR

Loader (can. & preserv.) 8-04.10

B-621 S-341

## Summary

The General Aptitude Test Battery, B-1002B, was administered to a final sample of 55 women employed as Loader 8-04.10 at American Home Foods, Inc., Milton, Pennsylvania. The criterion consisted of supervisory ratings. On the basis of mean scores, standard deviations, correlations with the criterion, job analysis data, and their combined selective efficiency, Aptitudes G-Intelligence, P-Form Perception and F-Finger Dexterity were selected for inclusion in the final test norms.

GATB Norms for Loader 8-04.10, B-621 S-341

| B-1001 | | | B-1002 | | |
|---|---|---|---|---|---|
| Aptitude | Tests | Minimum Acceptable Aptitude Score | Aptitude | Tests | Minimum Acceptable Aptitude Score |
| G | CB-1-H<br>CB-1-I<br>CB-1-J | 85 | G | Part 3<br>Part 4<br>Part 6 | 80 |
| P | CB-1-A<br>CB-1-L | 80 | P | Part 5<br>Part 7 | 80 |
| F | CB-1-O<br>CB-1-P | 85 | F | Part 11<br>Part 12 | 80 |

## Effectiveness of Norms

The data in Table IV indicate that only 67 percent of the non-test-selected workers used for this study were good workers; if the workers had been test-selected with the above norms, 80 percent would have been good workers. 33 percent of the non-test-selected workers used for this study were poor workers; if the workers had been test-selected with the above norms, only 20 percent would have been poor workers.

TECHNICAL REPORT

## I. Purpose

This study was conducted to determine the best combination of aptitudes and minimum scores to be used as norms on the General Aptitude Test Battery for the occupation of Loader 8-04.10.

## II. Sample

The General Aptitude Test Battery, B-1002B was administered during the period November 23-25, 1964 to 55 women employed as Loader 8-04.10 at American Home Foods, Inc., Milton, Pennsylvania.

Job requirement: The ability to speak, read and write English was required; experience was not necessary. No tests were used in the selection process.

Training: The on-the-job training period was four to six weeks. All women included in the experimental sample were considered experienced.

TABLE I

Means (M), Standard Deviations ($\sigma$), Ranges, and Pearson Product-Moment Correlations with the Criterion (r) for Age, Education, and Experience

| N = 55 | M | $\sigma$ | Range | r |
|---|---|---|---|---|
| Age (years) | 36.5 | 10.4 | 21-61 | -.281* |
| Education (years) | 11.2 | 1.4 | 8-14 | .145 |
| Experience (months) | 47.9 | 52.2 | 2-269 | .006 |

III. Job Description

Job Title: Loader 8-04.10

Job Summary: Loads Italian-style foods in cans, pockets of can-filling machines, or boxes, as one of a team of workers who interchange places on the line at hourly intervals and who move to different lines or pack a different product on the same line as necessary to meet production schedules.

Work Performed: Loads spaghetti: Stands with one or two other loaders at the revolving table of a can-filling machine and grasps cooked wet spaghetti coming from chute with both hands and pulls and pushes it into machine table pockets which hold the amount for one can. May act as inspector and drop a few strands into cans which are not full enough as they come from the machine.

Loads meatballs: Picks meatballs with both hands from pile on tray, grasping the proper number for the product being processed and adjusting to handling of different sizes of meatballs with different products. Loads meatballs with both hands into partially filled cans as they pass on conveyor, skillfully hitting moving targets, and also discarding any broken meatballs. Second girl of line fills cans not filled by first girl, while third position worker usually inspects and fills any not filled by first two of line. Positions are rotated so each worker has same amount of time on each position of line.

Loads dry spaghetti: Loads cutting machine by taking stick of dried spaghetti from truck and lays it on belt of cutting machine. Withdraws rod over which spaghetti was hung and places in barrel, completing cycle for first position. When working as second worker, takes two handfuls of cut spaghetti as it comes from cutting machine and loads it on platforms of two scales, observing pointers to be sure of correct weight as specified for package being run. In third position, grasps cut spaghetti from pans of two scales and loads in open boxes passing on conveyor belt.

Loads and spreads pizza shells: Lifts pan from stack and flat disc of dough from conveyor belt. Folds dough double and takes shortening from mass on bench and spreads it around edge of pan to make dough slide freely. Lifts dough and pulls it to enlarge. Lays dough in pan and with deft thumb and finger motion proceeds to spread dough to edge and to form flange as pan is turned between hands. Loads completed pizza shell and pan on conveyor belt.

## IV. Experimental Battery

All the tests of the GATB, B-1002B , were administered to the sample group.

## V. Criterion

The criterion data consisted of two sets of supervisory ratings made by the immediate supervisor on USES Form SP-21 "Descriptive Rating Scale." A period of at least two weeks elapsed between the first and second ratings. The rating scale consisted of nine items covering different aspects of job performance, with five alternatives for each item. Weights of one through five, indicating the degree of job proficiency attained, were assigned to the alternatives. A reliability coefficient of .82 was obtained for the criterion. Therefore, the two sets of ratings were combined, resulting in a distribution of final scores of 26-84, with a mean score of 61.8 and a standard deviation of 14.2.

## VI Qualitative and Quantitative Analyses

### A. Qualitative Analysis

On the basis of the job analysis data, the following aptitudes were rated "important" for success in this occupation:

Motor Coordination (K) - required to load meatballs or spaghetti into partially filled cans as they pass on conveyor by hitting the moving target.

Manual Dexterity (M) - required to load cooked spaghetti into machine table pockets; to load meatballs into cans and to load completed pizza shells and pans on conveyor belt.

On the basis of the job analysis data, V-Verbal Aptitude, N-Numerical Aptitude and Q-Clerical Perception were rated "irrelevant" for successfully performing the duties of this job.

B. Quantitative Analysis:

TABLE II

Means (M), Standard Deviations ($\sigma$), and Pearson Product-Moment Correlations with the Criterion (r) for the Aptitudes of the GATB; N = 55

| Aptitudes | M | $\sigma$ | r |
|---|---|---|---|
| G-Intelligence | 92.5 | 15.5 | .289* |
| V-Verbal Aptitude | 93.8 | 12.4 | .151 |
| N-Numerical Aptitude | 95.1 | 15.7 | .436** |
| S-Spatial Aptitude | 92.2 | 15.9 | .161 |
| P-Form Perception | 101.5 | 18.0 | .314* |
| Q-Clerical Perception | 102.2 | 14.2 | .327* |
| K-Motor Coordination | 104.8 | 16.8 | .337* |
| F-Finger Dexterity | 103.7 | 24.9 | .343* |
| M-Manual Dexterity | 113.1 | 23.0 | .316* |

C. Selection of Test Norms:

TABLE III

Summary of Qualitative and Quantitative Data

| Type of Evidence | Aptitudes | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | G | V | N | S | P | Q | K | F | M |
| Job Analysis Data | | | | | | | | | |
| Important | | | | | | | X | | X |
| Irrelevant | | X | X | | | X | | | |
| Relatively High Mean | | | | | | | X | X | X |
| Relatively Low Sigma | | X | | | | X | | | |
| Significant Correlation with Criterion | X | | X | | X | X | X | X | X |
| Aptitudes to be Considered for Trial Norms | G | | | | P | | K | F | M |

Trial norms consisting of various combinations of Aptitudes G,P,K,F and M with appropriate cutting scores were evaluated against the criterion by means of the Phi Coefficient technique. A comparison of the results showed that B-1002 norms consisting of G-80, P-80, and F-80 had the best selective efficiency.

## VII. Validity of Norms

The validity of the norms was determined by computing a Phi Coefficient between the test norms and the criterion and applying the Chi Square test. The criterion was dichotomized by placing 33 percent of the sample in the low criterion group because this percent was considered to be the unsatisfactory or marginal workers.

Table IV shows the relationship between test norms consisting of Aptitudes G, P and F with critical scores of 80, 80 and 80 respectively, and the dichotomized criterion for Loader 8-04.10. Workers in the high criterion group have been designated as "good workers" and those in the low criterion group as "poor workers."

TABLE IV

Validity of Test Norms for Loader 8-04.10
(G-80, P-80, F-80)

| N = 55 | Non-Qualifying Test Scores | Qualifying Test Scores | Total |
|---|---|---|---|
| Good Workers | 6 | 31 | 37 |
| Poor Workers | 10 | 8 | 18 |
| Total | 16 | 39 | 55 |

Phi Coefficient = .406
$\chi^2$ = 9.075
P/2 < .005

The data in the above table indicate a significant relationship between the test norms and the criterion for the sample.

## VIII. Conclusions

On the basis of the results of this study, Aptitudes G, P and F with minimum scores of 80, 80 and 80, respectively, have been established as B-1002 norms for the occupation of Loader 8-04.10. The equivalent B-1001 norms consist of G-85, P-80 and F-85.

## IX. Determination of Occupational Aptitude Pattern

The data for this study did not meet the requirements for incorporating the occupation studied into any of the 35 OAP's included in Section II of the Guide to the Use of the General Aptitude Test Battery, January 1962. The data for this sample will be considered for future groupings of occupations in the development of new occupational aptitude patterns.